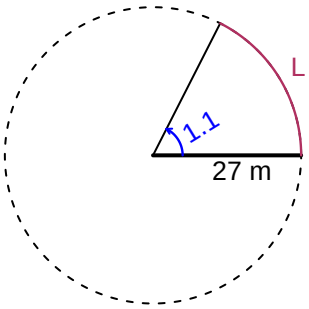
Name: Date:

# Trig Final (TEST v699)

- You can use a calculator (like Desmos)
- You should have a unit-circle with special angles and coordinates marked.

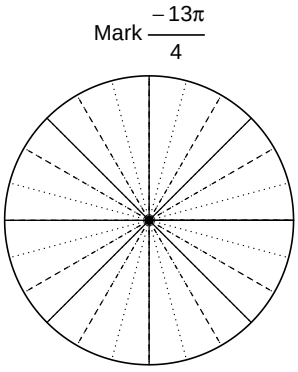
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 27 meters. The angle measure is 1.1 radians. How long is the arc in meters?

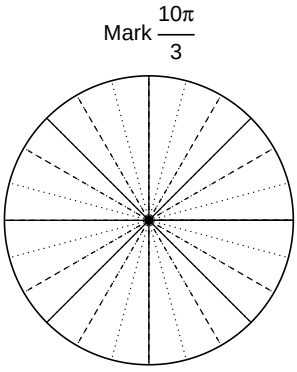



### Question 2

Consider angles $\frac{-13\pi}{4}$ and $\frac{10\pi}{3}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(\frac{-13\pi}{4}\right)$ and $\sin\left(\frac{10\pi}{3}\right)$ by using a unit circle (provided separately).




Find $\cos(-13\pi/4)$




Find $\sin(10\pi/3)$

**Question 3**

If $\tan(\theta) = \frac{-60}{11}$, and $\theta$ is in quadrant IV, determine an exact value for $\cos(\theta)$.

**Question 4**

A mass-spring system oscillates vertically with a frequency of 8.21 Hz, an amplitude of 2.88 meters, and a midline at $y = 4.51$ meters. At $t = 0$, the mass is at the midline and moving down. Write an equation to model the height ($y$ in meters) as a function of time ($t$ in seconds).